

A B S T R A C T

Even if a fiber fuse phenomenon occurs to start fire spreading, the fire spreading is shut off.

5 A graded index fiber (GIF) 3 is inserted between transmission-use single mode fibers (SMF) 2a, 2b on a fiber optics transmission line 1. The GIF 3 is so designed that its mode field diameter (MFD) gradually increases from a light entry side. The MFD exhibits a maximum value at a location 1/4
10 of a pitch from the end of the GIF 3. A GIF 3a is disposed on the light entry side. A GIF 3b having an MFD gradually decreasing is disposed on the opposite side of the GIF 3a. The GIF 3b is disposed on the light exit side. The lengths of the GIF 3a and GIF 3b are 1/4 of a pitch. The length of the GIF 3
15 formed by connecting the both is 1/2 of a pitch.

According to the present invention, an expanded MFD is inserted in the middle of the fiber optics transmission line, it is possible to shut off fire spreading caused due to fiber fuse phenomenon.